

<div>202</div> <div>230</div> <div>212</div> <div>218</div> Index C1 C2 RID A 1 000204 A 2 000202 D B 3 000203	<div>200</div> Data Table RID C1 C2 C3 C4 Locks 000201 ~226 000202 000203 B 3 23 QWP 000204 A 1 86 NEW X	<div>204</div> Lock Table RID Lock Attributes Transaction 000204 X Insert Trans.
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FIG 2(E) (Prior Art)

<div>202</div> <div>200</div> <div>204</div> Index C1 C2 RID A 1 000204 A 2 000202 D B 3 000203	Data Table RID C1 C2 C3 C4 Locks 000201 000202 000203 B 3 23 QWP 000204 A 1 86 NEW	Lock Table RID Lock Attributes Transaction
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FIG 2(F) (Prior Art)

302

300

304

<div>Index</div> <table> <tr> <th>C1</th> <th>C2</th> <th>RID</th> </tr> <tr> <td>A</td> <td>1</td> <td>000201</td> </tr> <tr> <td>A</td> <td>2</td> <td>000202</td> </tr> <tr> <td>B</td> <td>3</td> <td>000203</td> </tr> <tr> <td>B</td> <td>4</td> <td>000204</td> </tr> </table>	C1	C2	RID	A	1	000201	A	2	000202	B	3	000203	B	4	000204	<div>Data Table</div> <table> <tr> <th>RID</th> <th>C1</th> <th>C2</th> <th>C3</th> <th>C4</th> <th>Locks</th> </tr> <tr> <td>000201</td> <td>A</td> <td>1</td> <td>46</td> <td>ABC</td> <td></td> </tr> <tr> <td>000202</td> <td>A</td> <td>2</td> <td>54</td> <td>LMN</td> <td></td> </tr> <tr> <td>000203</td> <td>B</td> <td>3</td> <td>23</td> <td>QWP</td> <td></td> </tr> <tr> <td>000204</td> <td>B</td> <td>4</td> <td>97</td> <td>VED</td> <td></td> </tr> </table>	RID	C1	C2	C3	C4	Locks	000201	A	1	46	ABC		000202	A	2	54	LMN		000203	B	3	23	QWP		000204	B	4	97	VED		<div>Lock Table</div> <table> <tr> <th>RID</th> <th>Lock Attributes</th> <th>Transaction</th> </tr> </table>	RID	Lock Attributes	Transaction
C1	C2	RID																																																
A	1	000201																																																
A	2	000202																																																
B	3	000203																																																
B	4	000204																																																
RID	C1	C2	C3	C4	Locks																																													
000201	A	1	46	ABC																																														
000202	A	2	54	LMN																																														
000203	B	3	23	QWP																																														
000204	B	4	97	VED																																														
RID	Lock Attributes	Transaction																																																

FIG 3(A) (Prior Art)

Index			Data Table						Lock Table		
C1	C2	RID	RID	C1	C2	C3	C4	Locks	RID	Lock Attributes	Transaction
A	1	000201 D	000201	A	1	46	ABC	X	000201	X	T1
A	2	000202 D	000202	A	2	54	LMN	X	000202	X	T1
B	3	000203 D	000203	B	3	23	QWP	X	000203	X	T2
B	4	000204 D	000204	B	4	97	VED	X	000204	X	T2

FIG 3(B) (Prior Art)

302

312

Index

C1	C2	RID
A	1	000201 D
A	2	000202 D
B	3	000203 D
B	4	000204 D

300

Data Table

RID	C1	C2	C3	C4	Locks
000201					
000202					
000203					
000204					

314

304

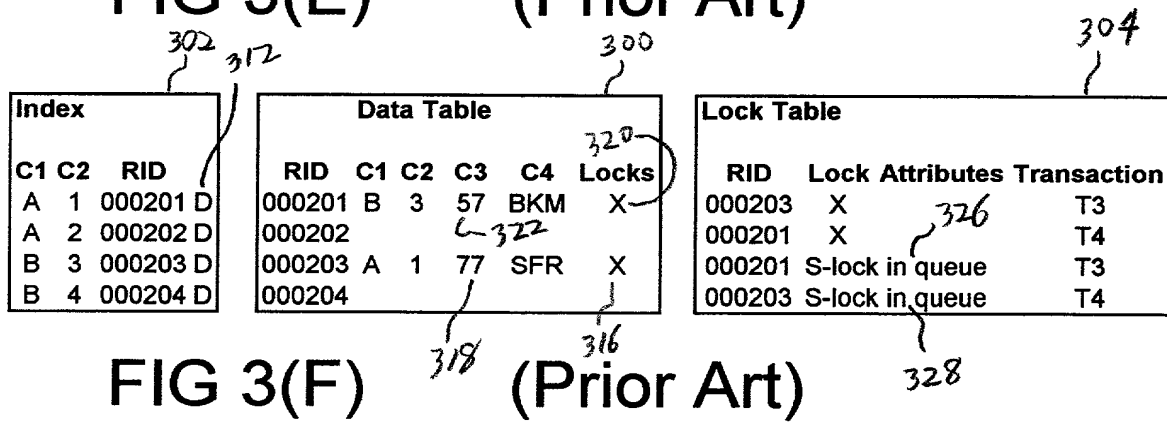
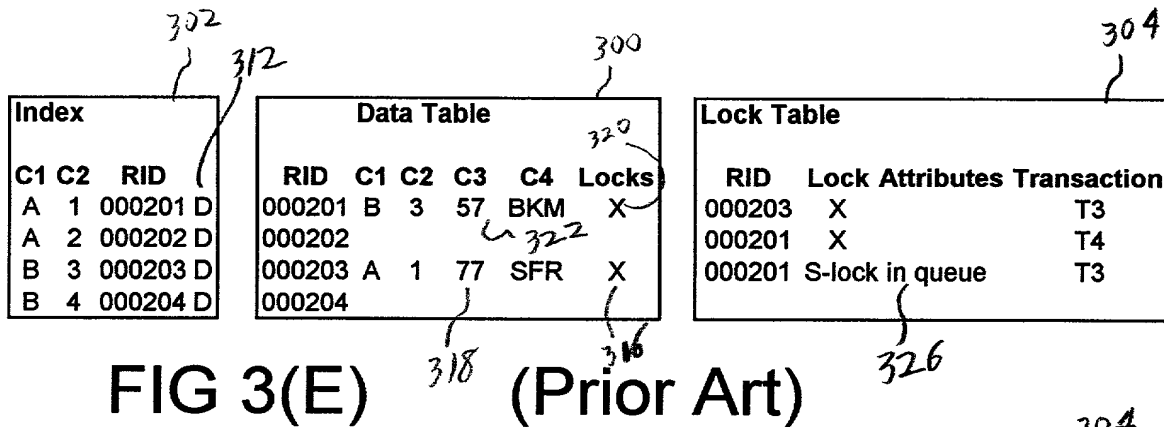
Lock Table

RID	Lock Attributes	Transaction
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FIG 3(C) (Prior Art)

Index			Data Table						Lock Table		
C1	C2	RID	RID	C1	C2	C3	C4	Locks	RID	Lock Attributes	Transaction
A	1	000201 D	000201	B	3	57	BKM	X	000203	X	T3
A	2	000202 D	000202						000201	X	T4
B	3	000203 D	000203	A	1	77	SFR	X			
B	4	000204 D	000204								

FIG 3(D) (Prior Art)



402

Index

C1	C2	RID
A	1	000201
A	2	000202
B	3	000203

400

Data Table

RID	C1	C2	C3	C4	Locks
000201	A	1	46	ABC	
000202	A	2	54	LMN	
000203	B	3	23	QWP	
000204					

404

Lock Table

RID	Lock	Attributes	Transaction
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FIG 4(A)

FIG 4(A)

402

Index		
C1	C2	RID
A	1	000201 D
A	2	000202 D
B	3	000203

412

Data Table					
RID	C1	C2	C3	C4	Locks
000201	A	1	46	ABC	X
000202	A	2	54	LMN	X
000203	B	3	23	QWP	
000204					

400

Lock Table			
RID	Lock	Attributes	Transaction
000201	X	Delete	Delete C1=A
000202	X	Delete	Delete C1=A

404

410

450

FIG 4(B)

FIG 4(B)

The diagram illustrates three database tables and their relationships, with handwritten annotations:

- Index Table (402):** Contains columns C1, C2, and RID. It lists three entries: (A, 1, 000201 D), (A, 2, 000202 D), and (B, 3, 000203). A bracket labeled 402 groups the entire table.
- Data Table (400):** Contains columns RID, C1, C2, C3, C4, and Locks. It lists four entries: (000201, A, 1, 46, ABC, X), (000202, A, 2, 54, LMN, X), (000203, B, 3, 23, QWP, 410), and (000204, A, 1, 86, NEW, X). A bracket labeled 400 groups the entire table.
- Lock Table (404):** Contains columns RID, Lock, Attributes, and Transaction. It lists three entries: (000201, X, Delete, Delete C1=A), (000202, X, Delete, Delete C1=A), and (000204, X, 450, Insert Trans.). A bracket labeled 404 groups the entire table.

Handwritten annotations include:

- 400: Points to the Data Table.
- 402: Points to the Index Table.
- 404: Points to the Lock Table.
- 410: Points to the Locks column in the Data Table for RID 000203.
- 450: Points to the Attributes column in the Lock Table for RID 000204.

FIG 4(C)

FIG 4(C)

The diagram illustrates three tables: Index, Data Table, and Lock Table. Handwritten annotations 402, 400, and 404 are present above the tables.

Index Table (402):

C1	C2	RID
A	1	000201 D
A	2	000202 D
B	3	000203

Data Table (400):

RID	C1	C2	C3	C4	Locks
000201	A	1	46	ABC	X
000202	A	2	54	LMN	X
000203	B	3	23	QWP	
000204	A	1	86	NEW	X

Lock Table (404):

RID	Lock	Attributes	Transaction
000201	X	Delete	Delete C1=A
000202	X	Delete	Delete C1=A
000204	X		Insert Trans.
000201	S-lock in queue		Insert Trans.

FIG 4(D)

<div>402</div> <div>430</div> <div>428</div> Index C1 C2 RID A 1 000204 A 2 000202 D B 3 000203 <div>412</div>	<div>400</div> Data Table RID C1 C2 C3 C4 Locks 000201 000202 ~ 426 000203 B 3 23 QWP 000204 A 1 86 NEW X	<div>404</div> Lock Table RID Lock Attributes Transaction 000204 X Insert Trans.
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FIG 4(E)

<div>402</div> Index C1 C2 RID A 1 000204 A 2 000202 D B 3 000203	<div>400</div> Data Table RID C1 C2 C3 C4 Locks 000201 000202 000203 B 3 23 QWP 000204 A 1 86 NEW	<div>404</div> Lock Table RID Lock Attributes Transaction
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FIG 4(F)

Index			Data Table						Lock Table		
C1	C2	RID	RID	C1	C2	C3	C4	Locks	RID	Lock Attributes	Transaction
A	1	000201	000201	A	1	46	ABC				
A	2	000202	000202	A	2	54	LMN				
B	3	000203	000203	B	3	23	QWP				
B	4	000204	000204	B	4	97	VED				

FIG 5(A)

Index			Data Table						Lock Table			
C1	C2	RID	RID	C1	C2	C3	C4	Locks	RID	Lock Attributes	Transaction	
A	1	000201 D	000201	A	1	46	ABC	X	000201	X	Delete	T1
A	2	000202 D	000202	A	2	54	LMN	X	000202	X	Delete	T1
B	3	000203 D	000203	B	3	23	QWP	X	000203	X	Delete	T2
B	4	000204 D	000204	B	4	97	VED	X	000204	X	Delete	T2

FIG 5(B)

Index			Data Table						Lock Table		
C1	C2	RID	RID	C1	C2	C3	C4	Locks	RID	Lock Attributes	Transaction
A	1	000201 D	000201								
A	2	000202 D	000202								
B	3	000203 D	000203								
B	4	000204 D	000204								

FIG 5(C)

Index			Data Table						Lock Table		
C1	C2	RID	RID	C1	C2	C3	C4	Locks	RID	Lock Attributes	Transaction
A	1	000201 D	000201	B	3	57	BKM	X	000203	X	T3
A	2	000202 D	000202						000201	X	T4
B	3	000203 D	000203	A	1	77	SFR	X			
B	4	000204 D	000204								

FIG 5(D)

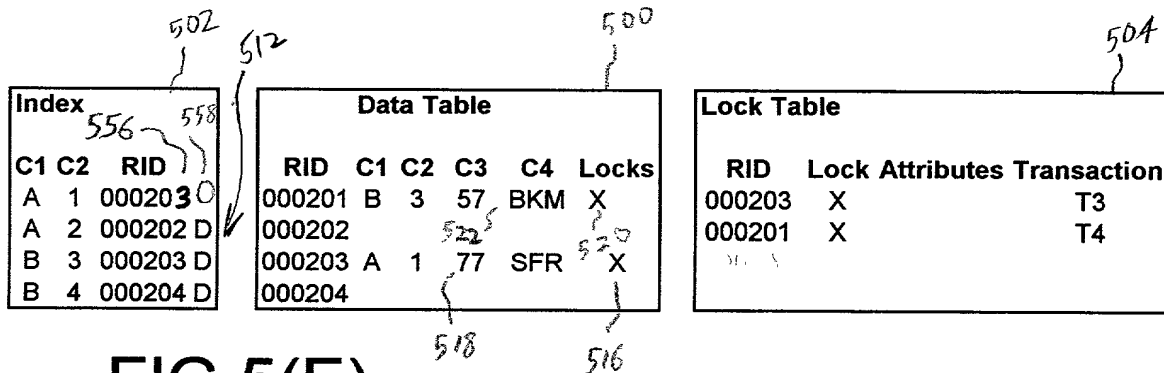


FIG 5(E)

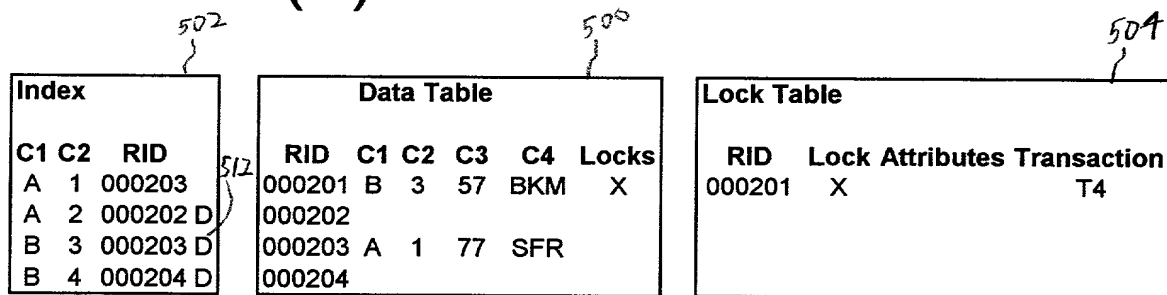


FIG 5(F)

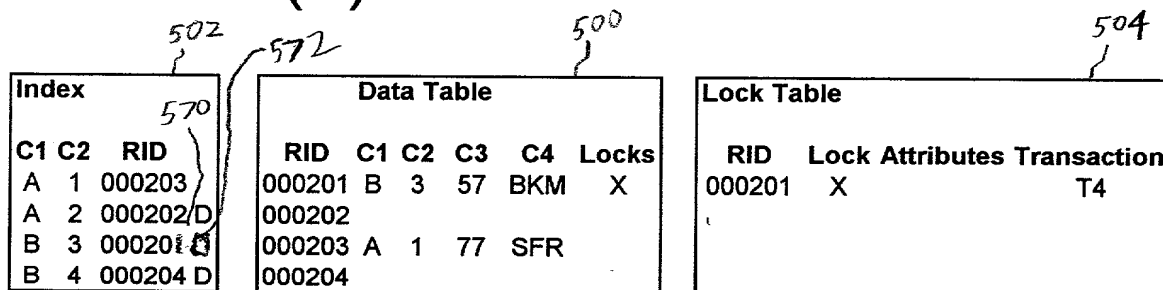


FIG 5(G)

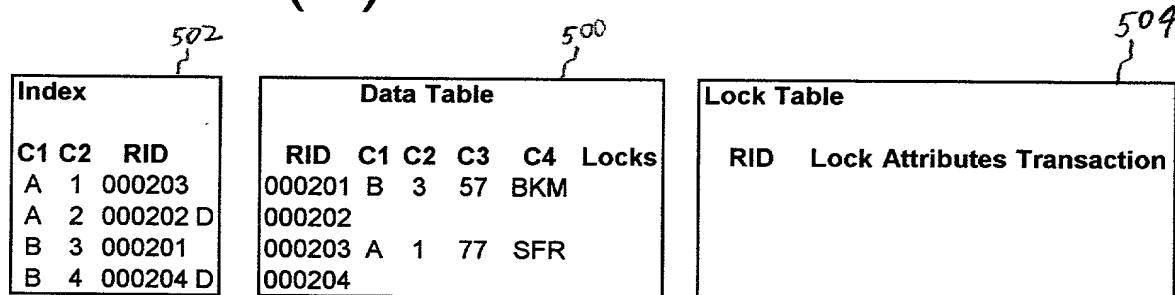


FIG 5(H)

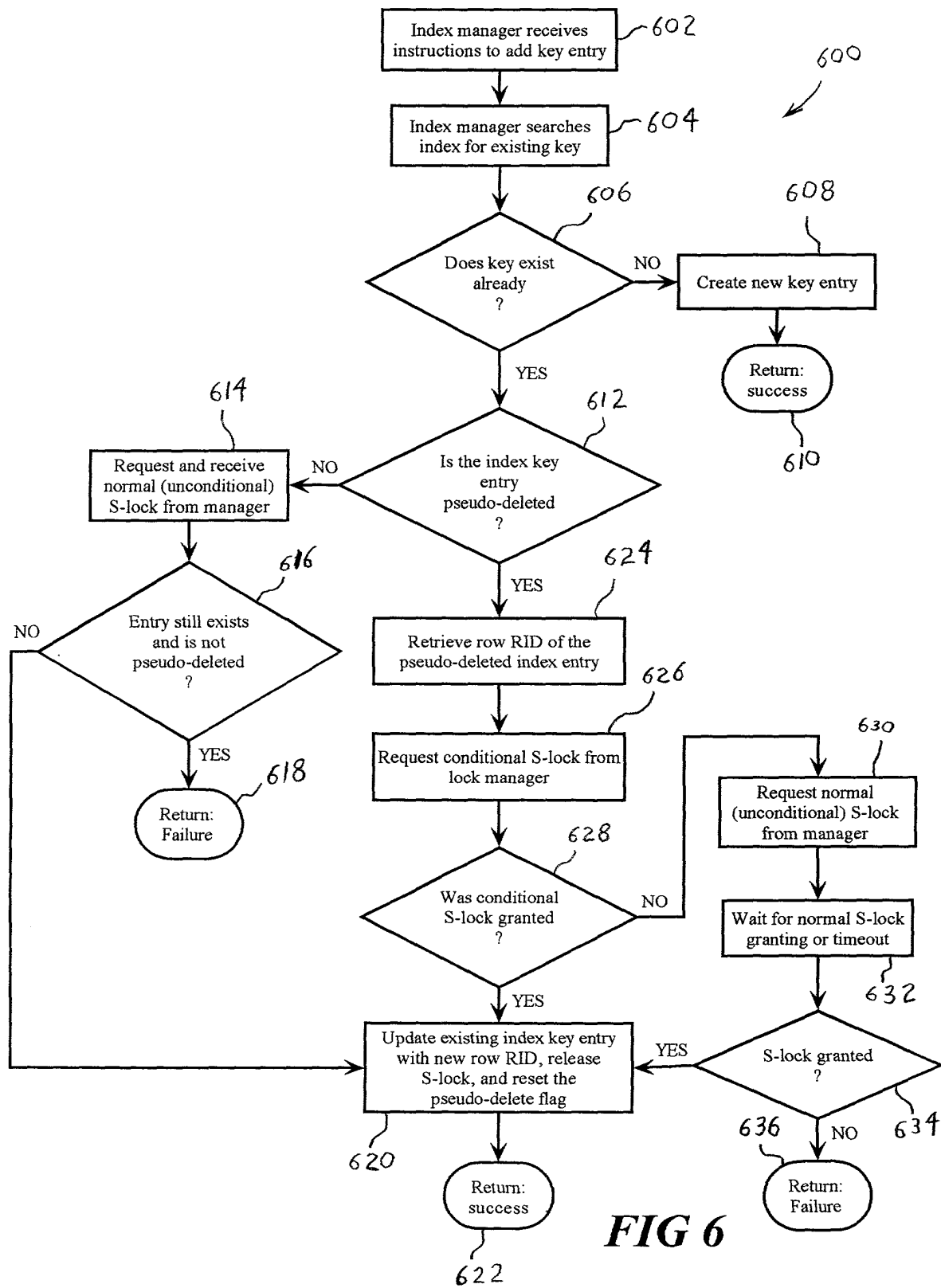


FIG 6